

NOAA Technical Memorandum

NMFS-SEFC-45



THE OCCURRENCE OF LIFE STAGES OF SOME
RECREATIONAL MARINE FISHES IN ESTUARIES
OF THE GULF OF MEXICO

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May 1980

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
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PREFACE

This report summarizes the results of a project that was conducted in 1974-75. In addition to the information that we sought, our efforts produced an extensive bibliography on fishes in the estuaries of the Gulf of Mexico. Some of our colleagues suggested that we include additional species and that we update the references. The unlikelihood of our doing so becomes more apparent with the passage of time. We therefore present this version of our report with the hope that others may find it useful.

THE OCCURRENCE OF LIFE STAGES OF SOME RECREATIONAL
MARINE FISHES IN ESTUARIES OF THE GULF OF MEXICO

Many recreationally and commercially important marine fishes are dependent upon estuaries at some time in their life cycle. Most of these species have life histories wherein the adults spawn offshore, and the young move into estuaries to feed and grow (Gunter 1961, 1967). The life histories of the commercially important species are sufficiently known to permit estimates of the portion of the catches which are estuarine dependent. A number of authors have made such estimates (Gunter 1967; Lindall 1973; McHugh 1966, 1967; Skud and Wilson 1960; Sykes 1964, 1965, 1968; Sykes and Finucane 1966; Thompson 1968; and others). Estimates as high as 90% have been made for commercial species in the Gulf of Mexico (Skud and Wilson 1960; Thompson 1968). Comparable percentages for recreational species are more difficult to estimate owing to the lack of both adequate catch data and sufficient biological information.

We reviewed what was known of the distribution and occurrence of the various life stages of recreational fishes in estuaries along the U.S. coast of the Gulf of Mexico. We examined various publications and tallied, by species and by life stages, those recreational fishes that had been reported in estuaries. The presence of a species in an estuary does not necessarily imply its dependence upon that habitat; it may be an adventitious visitor (McHugh 1967). But, if the life history is not fully known, we may be in error in identifying adventitious visitors. Therefore, we included all of the selected species of recreational fishes in our tally.

The selection of species as recreational fishes is admittedly subjective. Agreement is difficult to obtain, because a fish may be considered a recreational species in one area, but not in another, and also because a fish may be considered a recreational species by one fisherman, but not by another. We made our selections from the List of Common and Scientific Names of Fishes from the United States and Canada (Bailey 1970). A total of sixty-eight species was selected (Table 1).

Definitions of larva and juvenile were those generally used by biologists, such as by Mansueti and Hardy (1967):

Larva - "Young fish between time of hatching and attainment of adult fin-ray complement."

Juvenile - "Young fish after attainment of full adult counts and before sexual maturation."

Adult is the stage at which sexual maturity is attained. Many references gave sizes of fishes without stating the life stages. In such cases, we determined life stages by referring to other authors who had given both the sizes and life stages.

The literature citations are presented alphabetically and numerically. Numerical references are used in the appendix tables for convenience.

For our purpose the estuarine areas of the U.S. coast of the Gulf of Mexico included all bays, harbors, sounds, lakes, and lagoons which were connected directly to the Gulf of Mexico. The seaward boundary was the imaginary line connecting the points of land marking the entrance or entrances to the embayments. The estuarine areas of the Gulf of Mexico were delimited as follows: The Florida coast was divided into four areas following the demarcations of McNulty et al. (1972); the Alabama coast was considered one area; the Mississippi coast was considered one area; the Louisiana coast was divided into two areas; and the coast of Texas was divided into three areas. The boundaries of the eleven estuarine areas, as illustrated in Figure 1, are as follows:

- I. Rio Grande River through Laguna Madre
- II. Corpus Christi Bay to Freeport
- III. Freeport through Sabine River
- IV. Louisiana coast west of Mississippi River
- V. Louisiana coast east of Mississippi River
- VI. Mississippi coast
- VII. Alabama coast
- VIII. Perdido Bay to Lighthouse Point
- IX. Lighthouse Point through Anclote Key
- X. Anclote River to Cape Romano
- XI. Cape Romano through Florida Bay

The sixty-eight species consisted of eleven sharks and fifty-seven bony fishes (Table 1). The sharks were included, because shark fishing is becoming increasingly popular. All of the eleven sharks give birth to live young, and therefore, they do not have egg and larval stages. Eight of the eleven had their juvenile and adult stages reported in estuaries (Table 1). The nurse shark (Ginglymostoma cirratum) had only its adult stage reported, while the sandbar shark (Carcharhinus milberti) had only its juvenile stage reported; both of these, plus the smooth hammerhead (Sphyrna zygaena), were also reported in estuaries by authors who did not state sizes or life stages. Of the bony fishes, three species had all stages from egg to adult present in estuaries. These three were the two marine catfishes (Arius felis and Bagre marinus), the males of which incubate the eggs in their mouths, and the black drum (Pogonias cromis), which has been found to spawn in the bays and lagoons of Texas. Of the remaining fifty-four, twenty-six species had their larval, juvenile, and adult stages reported in estuaries; twenty-five had their juvenile and adult stages reported. One (the bonefish, Albula vulpes) had its larval and juvenile stages reported in estuaries (one report did not state size or life stage of the bonefish--see appendix tables); two (the greater amberjack, Seriola dumerili, and the guaguanche, Sphyraena guachancho)

had only their juvenile stage reported in estuaries (several references of the guaguanche did not state size of life stage).

In each estuarine area, the number of species was lowest for eggs, second lowest for larvae, third lowest for adults, and highest for juveniles (Table 2). Thus, additional credence is provided to the importance of estuaries as nursery grounds for juvenile recreational fishes (Gunter 1961, 1967). The few reports of eggs and larvae result from several factors: one, some of the species spawn offshore; two, eggs and larvae are difficult to identify; and three, relatively few studies have been conducted on ichthyoplankton in estuaries of the Gulf of Mexico. Those studies that have been made were either lacking in specific identifications, or were limited to larvae of a certain family, or were limited in sampling (Arnold, Wheeler, and Baxter 1960; Gillespie 1971; Jannke 1971; Kelly and Dragovich 1968; Perry and Christmas 1973; Swingle 1971). More systematic studies of ichthyoplankton would yield information on the importance of estuaries as spawning grounds.

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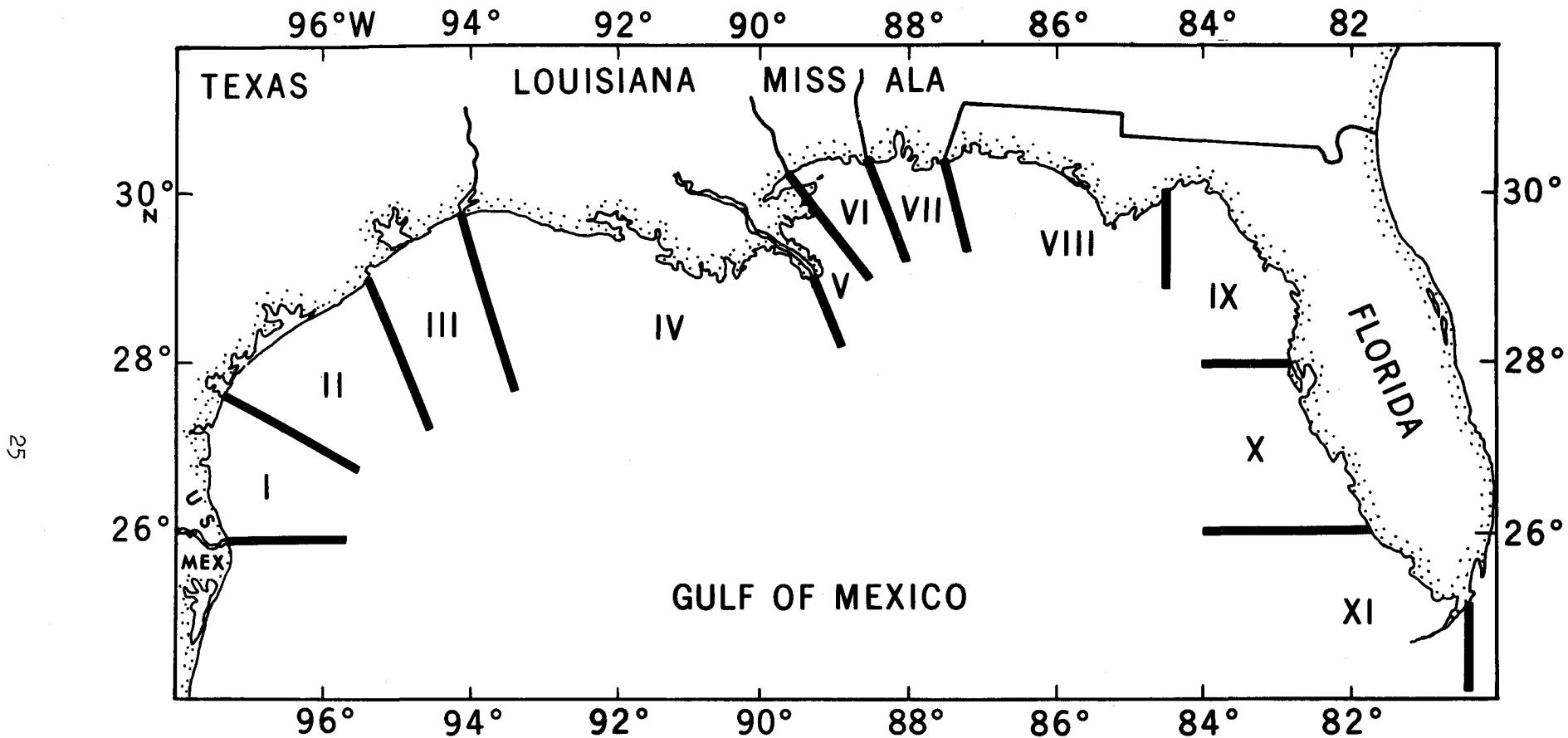


Figure 1---Estuarine areas of the U.S. coast of the Gulf of Mexico.

Table 1.--Occurrence of life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico. "x" indicates occurrence has been reported in the literature.

Life Stage	Egg	Larva	Juvenile	Adult	Unspecified
Orectolobidae - carpet sharks					
Nurse shark (<u>Ginglymostoma cirratum</u>)				x	x
Carcharhinidae - requiem sharks					
Finetooth shark (<u>Aprionodon isodon</u>)	x		x	x	
Blacknose shark (<u>Carcharhinus acronotus</u>)	x		x	x	
Bull shark (<u>Carcharhinus leucas</u>)	x		x	x	
Blacktip shark (<u>Carcharhinus limbatus</u>)	x		x	x	
Sandbar shark (<u>Carcharhinus milberti</u>)	x				x
Atlantic sharpnose shark (<u>Rhizoprionodon terraenovae</u>)	x		x	x	
Sphyrnidae - hammerhead sharks					
Scalloped hammerhead (<u>Sphyrna lewini</u>)	x		x	x	
Great hammerhead (<u>Sphyrna mokarran</u>)	x		x	x	
Bonnethead (<u>Sphyrna tiburo</u>)	x		x	x	
Smooth hammerhead (<u>Sphyrna zygaena</u>)					x

Table 1.--Occurrence of life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico. "x" indicates occurrence has been reported in the literature. (cont'd)

Life Stage	Egg	Larvae	Juvenile	Adult	Unspecified
Elopidae - tarpons					
Ladyfish (<u>Elops saurus</u>)	x	x	x	x	x
Tarpon (<u>Megalops atlantica</u>)	x	x	x	x	x
Bonefish (<u>Albula vulpes</u>)	x	x			x
Clupeidae - herrings					
Alabama shad (<u>Alosa alabamae</u>)			x	x	x
Skipjack herring (<u>Alosa chrysochloris</u>)			x	x	x
Ariidae - sea catfishes					
Sea catfish (<u>Arius felis</u>)	x	x	x	x	x
Gafftopsail catfish (<u>Bagre marinus</u>)	x	x	x	x	x
Centropomidae - snooks					
Tarpon snook (<u>Centropomus pectinatus</u>)					x
Snook (<u>Centropomus undecimalis</u>)			x	x	x
Percichthyidae - temperate basses					
Striped bass (<u>Morone saxatilis</u>)		x	x	x	x

Table 1.--Occurrence of life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico. "x" indicates occurrence has been reported in the literature. (cont'd)

Life Stage	Egg	Larva	Juvenile	Adult	Unspecified
Serranidae - sea basses					
Southern sea bass (<u>Centropristes melana</u>)		x	x	x	
Rock sea bass (<u>Centropristes philadelphica</u>)	x		x	x	
Jewfish (<u>Epinephelus itajara</u>)	x		x	x	
Gag (<u>Mycteroperca microlepis</u>)	x		x	x	
Red grouper (<u>Epinephelus morio</u>)	x		x	x	
Pomatomidae - bluefishes					
Bluefish (<u>Pomatomus saltatrix</u>)	x	x	x	x	
Rachycentridae - cobias					
Cobia (<u>Rachycentron canadum</u>)	x	x	x	x	
Carangidae - jacks and pompanos					
Blue runner (<u>Caranx crysos</u>)	x	x	x	x	
Crevalle jack (<u>Caranx hippos</u>)	x	x	x	x	
Greater amberjack (<u>Seriola dumerili</u>)			x		
Florida pompano (<u>Trachinotus carolinus</u>)	x	x	x	x	
Permit (<u>Trachinotus falcatus</u>)	x	x	x	x	

Table 1.--Occurrence of life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico. "x" indicates occurrence has been reported in the literature. (cont'd)

Life Stage	Egg	Larva	Juvenile	Adult	Unspecified
Lutjanidae - snappers					
Red snapper (<u>Lutjanus campechanus</u>)			x	x	x
Gray snapper (<u>Lutjanus griseus</u>)			x	x	x
Lane snapper (<u>Lutjanus synagris</u>)			x	x	x
Lobotidae - tripletails					
Tripletail (<u>Lobotes surinamensis</u>)			x	x	x
Gerreidae - mojarras					
Striped mojarra (<u>Diapterus plumieri</u>)			x	x	x
Pomadasytidae - grunts					
Tomtate (<u>Haemulon aurolineatum</u>)			x	x	x
White grunt (<u>Haemulon plumieri</u>)			x	x	x
Pigfish (<u>Orthopristis chrysoptera</u>)	x	x	x	x	x
Sparidae - porgies					
Sheepshead (<u>Archosargus probatocephalus</u>)	x	x	x	x	x
Pinfish (<u>Lagodon rhomboides</u>)	x	x	x	x	x

Table 1.--Occurrence of life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico. "x" indicates occurrence has been reported in the literature. (cont'd)

Life Stage	Egg	Larva	Juvenile	Adult	Unspecified
Sciaenidae - drums					
Silver perch (<u>Bairdiella chrysura</u>)		x	x	x	x
Sand seatrout (<u>Cynoscion arenarius</u>)	x	x	x	x	x
Spotted seatrout (<u>Cynoscion nebulosus</u>)	x	x	x	x	x
Spot (<u>Leiostomus xanthurus</u>)	x	x	x	x	x
Southern kingfish (<u>Menticirrhus americanus</u>)	x	x	x	x	x
30 Minkfish (<u>Menticirrhus focaliger</u>)	x	x	x	x	x
Black drum (<u>Pogonias cromis</u>)	x	x	x	x	x
Atlantic croaker (<u>Micropogon undulatus</u>)	x	x	x	x	x
Red drum (<u>Sciaenops ocellata</u>)	x	x	x	x	x
Ephippidae - spadefishes					
Atlantic spadefish (<u>Chaetodipterus faber</u>)	x	x	x	x	x
Mugilidae - mullets					
Striped mullet (<u>Mugil cephalus</u>)	x	x	x	x	x
White mullet (<u>Mugil curema</u>)	x	x	x	x	x
Fantail mullet (<u>Mugil trichodon</u>)	x	x	x	x	x

Table 1.--Occurrence of life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico. "x" indicates occurrence has been reported in the literature. (cont'd)

Life Stage	Egg	Larva	Juvenile	Adult	Unspecified
Sphyraenidae - barracudas					
Guaguanche (<u>Sphyraena guachancho</u>)			x		x
Great barracuda (<u>Sphyraena barracuda</u>)	x	x	x	x	
Northern sennet (<u>Sphyraena borealis</u>)		x	x	x	
Scombridae - mackerels and tunas					
Little tunny (<u>Euthynnus alletteratus</u>)		x	x	x	
King mackerel (<u>Scomberomorus cavalla</u>)		x	x	x	
Spanish mackerel (<u>Scomberomorus maculatus</u>)	x	x	x	x	
Bothidae - lefteye flounders					
Gulf flounder (<u>Paralichthys alboguttata</u>)	x	x	x	x	
Southern flounder (<u>Paralichthys lethostigma</u>)	x	x	x	x	
Balistidae - triggerfish and filefishes					
Gray triggerfish (<u>Balistes capriscus</u>)	x	x	x	x	
Orange filefish (<u>Aluterus schoepfii</u>)		x	x	x	
Tetraodontidae - puffers					
Southern puffer (<u>Sphoeroides nephelus</u>)	x	x	x	x	

Table 2. Numbers of selected recreational fishes by life stages reported in estuarine areas of the U.S. coast of the Gulf of Mexico.

State Estuarine Area	TX			LA		MS VI	AL VII	FL			
	I	II	III	IV	V			VIII	IX	X	XI
Egg	2	2	1	1	0	0	0	2	0	1	2
Larva	10	20	15	12	6	1	9	11	8	10	11
Juvenile	20	43	27	35	24	21	49	54	38	45	41
Adult	17	24	20	22	17	15	33	46	24	34	32
Unspecified ^{1/}	13	3	9	5	2	25	1	3	14	7	5

^{1/} Number of species reported only as present, size or life stage not specified.

Appendix Table A.--References to life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico : Texas. E = egg; L = larva; J = juvenile; A = adult; U = unspecified.

Family - Species	TEXAS														
	I Rio Grande River through Laguna Madre					II Corpus Christi Bay to Freeport				III Freeport through Sabine River					
	E	L	J	A	U	E	L	J	A	U	E	L	J	A	U
Orectolobidae - carpet sharks															
Nurse shark (<u>Ginglymostoma cirratum</u>)															
Carcharhinidae - requiem sharks															
Finetooth shark (<u>Apriodon isodon</u>)						249			106				16		106
									125						
Blacknose shark (<u>Carcharinus acronotus</u>)									125			14			
Bull shark (<u>Carcharhinus leucas</u>)						16			125		16		16		212
									183		124				
									129						
Blacktip shark (<u>Carcharhinus limbatus</u>)			46		16				125	97			16		212
					249									225	
														226	
														229	
Sandbar shark (<u>Carcharhinus milberti</u>)															
Atlantic sharpnose shark (<u>Rhizoprionodon terraenovae</u>)									125						
Sphyranididae - hammerhead sharks															
Scalloped hammerhead (<u>Sphyra lewini</u> = <u>S. diplanata</u>)									125					212	
Great hammerhead (<u>Sphyra mokarran</u>)									16						
									125						
Bonnethead (<u>Sphyra tiburo</u>)			16						16					16	
			32						97						212
									125						
									129						
Other hammerheads (<u>Sphyra</u> spp.)			16											16	
			32												
Elopidae - tarpons															
Ladyfish (<u>Elops saurus</u>)	34	34	34	31			123	97	97	68		4	81		20
	46	46	46	32			125	123	98			69	226		191
							102		99			88			212
							119	125	188	183					214
								188							225
								217							227
Tarpon (<u>Megalops atlantica</u>)			31					14	183	168			14		212
			32					97		251					
			46							257					
			249												
Bonefish (<u>Albula vulpes</u>)						125	125						212		
Clupeidae - herrings															
Alabama shad (<u>Alosa alabamae</u>)															
Skipjack herring (<u>Alosa chrysochloris</u>)															
Ariidae - sea catfishes															
Sea catfish (<u>Arius felis</u>)	31		31	102		68	88	24	25	80	69	59	59	59	20
	32		32	119		97	145	25	88	105	225	69	81	81	54
	46		46	249				68	97	168	229	81	91	88	143
								97	127	183		91	229	91	144
								127	145	251		229		225	212
								145						229	228

Appendix Table A.--References to life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico: Texas. E = egg; L = larva; J = juvenile; A = adult; U = unspecified.

Family - Species	I Rio Grande River through Laguna Madre					TEXAS II Corpus Christi Bay to Freeport					III Freeport through Sabine River				
	E	L	J	A	U	E	L	J	A	U	E	L	J	A	U
Gafftopsail catfish <i>(Bagre marinus)</i>		46	31			127	25	97	68		59	59	226	54	
			32				97		124		81	81	231	69	
			80				127		168			226		191	
			249						251			231		193	
														212	
														213	
														225	
														227	
Centropomidae - snooks															
Tarpon snook <i>(Centropomus pectinatus)</i>															
Snook (<i>Centropomus undecimalis</i>)		46	31					15		257					
			32												
Percichthyidae - temperate basses															
Striped bass (<i>Morone saxatilis</i>)															
Serranidae - sea basses															
Southern sea bass <i>(Centropristes melana)</i>															
Rock sea bass <i>(Centropristes philadelphica)</i>							125	185	15					212	
							185								
Jewfish (<i>Epinephelus itajara</i>)			32					183						212	
Gag (<i>Mycteroperca microlepis</i>)														15	
Red grouper (<i>Epinephelus morio</i>)															
Pomatomidae - bluefishes															
Bluefish (<i>Pomatomus saltatrix</i>)			102				97	183			4			212	
							125	257						228	
							266								
Rachycentridae - cobias															
Cobia (<i>Rachycentron canadum</i>)							15	183			212				
							125	257							
Carangidae - jacks and pompanos															
Blue runner (<i>Caranx cryos</i>)		46	32					168						212	
Crevalle jack (<i>Caranx hippos</i>)	32	32	46				25	68			4	4		20	
	249	249					97	98			226			69	
							125	168						191	
							217	257						212	
														227	
														229	
Greater amberjack <i>(Seriola dumerili)</i>															
Florida pompano <i>(Trachinotus carolinus)</i>	34	34	32				66	99			4	4		191	
			249				125	168			176	176		212	
							183				227	227		229	
Permit (<i>Trachinotus falcatus</i>)									15						
									99						
Lutjanidae - snappers															
Red snapper (<i>Lutjanus campechanus</i>)															

Appendix Table A---References to life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico: Texas. E = egg; L = larva; J = juvenile; A = adult; U = unspecified.

Family - Species	TEXAS														
	I Rio Grande River through Laguna Madre					II Corpus Christi Bay to Freeport				III Freeport through Sabine River					
	E	L	J	A	U	E	L	J	A	U	E	L	J	A	U
Gray snapper (<u>Lutjanus griseus</u>)						88		13						13	
						97		15						212	
						168		105							
						188									
Lane snapper (<u>Lutjanus synagris</u>)						88					4		212		
Lobotidae - tripletails															
Tripletail (<u>Lobotes surinamensis</u>)						11		15	97	11			226	11	
						249							227	212	
													229		
Gerreidae - mojarra															
Striped mojarra (<u>Diapterus plumieri</u>)															
Pomadasytidae - grunts															
Tomtate (<u>Haemulon aurolineatum</u>)															
White grunt (<u>Haemulon plumieri</u>)															
Pigfish (<u>Orthopristis chrysoptera</u>)	25	25	31			65	24	97	35		4	176	20		
	34	34	32			125	25		68			176	35		
	35	35	249				88		80			226	69		
	249	249	35				97		124				88		
			46				119		125				191		
									128				212		
									129				214		
													251		
Sparidae - porgies															
Sheepshead (<u>Archosargus probatocephalus</u>)	32	25	33			35	25	32			4	35	4	20	
	34	34	116			38	35	68				37	35	69	
	35	35	249			40	37	80				38	37	144	
	37	37				41	40	105				40	38	193	
	38	39				42	41	116				41	40	212	
	39	40				97	42	124				42	41		
	40	41				125	97	128				191	42		
	41	42				151	145	168				192	192		
	42	113				152	151	183				214	259		
	46	114				178	178	257				259	261		
	113	115				180	179	260				261			
	259	259				188	180								
						196	196								
						197	245								
						245	246								
						246	247								
						247	259								
						259									
Pinfish (<u>Lagodon rhomboides</u>)	65	25	34	24		65	24	35			4	81	176	35	
	34	249	31			66	24	51				128	225	51	
	65		32			25	97	68				176	54		
	119	35				52	125	80				191	69		
	249	46				57	154	98				214	143		
		51				65	296	99				226	144		
		102				66	298	105					212		
		114				97		124					227		
		142				125		145					229		
						129		168							
						154		179							
						296		197							
						298		245							
								246							
								251							
								297							

Appendix Table A.--References to life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico: Texas. E = egg; L = larva; J = juvenile; A = adult; U = unspecified.

Family - Species	TEXAS													
	I Rio Grande River through Laguna Madre					II Corpus Christi Bay to Freeport					III Freeport through Sabine River			
	E	L	J	A	U	E	L	J	A	U	E	L	J	A
Sciaenidae - drums														
Silver perch <i>(Bairdiella chrysura)</i>	25	32	24			125	25	24	68		4	81	176	69
	32	34	46				97	25	80			231	226	143
	34		119				125	88	98			231	191	
			249				145	97	105				212	
							217	145	124				214	
							232		128				227	
									168				228	
									244					
									251					
Sand seatrout <i>(Cynoscion arenarius)</i>	34	31				24	25	68			4	59	91	20
	46	32				25	80	124				81	229	54
		33				80	97	168				91		55
		249				97	145	244				191		69
						125	251	260				226		193
							127					227		212
							145					229		214
							151					231		225
							251							
Spotted seatrout <i>(Cynoscion nebulosus)</i>	217	32	31	33		152	26	35	33		4	35	4	54
	34	32	102			217	35	37	68			37	35	69
	35	34	116				37	38	80			38	37	116
	36	35	118				38	40	98			40	40	193
	37	36	244				40	41	105			41	41	212
	38	37	274				41	42	116			42	42	214
	39	38					42	56	124			81	143	225
	40	39					56	57	155			143	144	227
	41	40					57	58	168			144	192	229
	42	41					58	97	244			191	233	274
	46	42					97	151	257			192	259	
	113	46					125	178	260			226	261	
	114	113					151	179	274			259		
	115	114					152	180				261		
	119	115					178	183						
	217	119					179	196						
	249	249					180	245						
	259	259					183	246						
							188	247						
							196	251						
							197	259						
							217							
							245							
							246							
							247							
							251							
							259							
Spot (<i>Leiostomus xanthurus</i>)	34	25	32	24		65	24	97	68		4	54	59	20
	217	31	34	114		80	25	98				59	91	55
		34	46	244		217	57	105				91	69	147
		46	119				80	124				213	81	176
		119	249				88	168					88	213
		217					97	179					91	226
		249					125	244					147	214
							127						176	
							128						191	
							145						213	
							151						225	
							155						226	
							217						227	
													229	
													230	
													287	
Southern kingfish <i>(Menticirrhus americanus)</i>	125	97	97	80								88		20
		125		99								214		69
				124								227		116
				168										191
				183										212
				244										229

Appendix Table A.--References to life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico: Texas. E = egg; L = larva; J = juvenile; A = adult; U = unspecified.

Family - Species	TEXAS													
	I Rio Grande River through Laguna Madre					II Corpus Christi Bay to Freeport					III Freeport through Sabine River			
	E	L	J	A	U	E	L	J	A	U	E	L	J	A
Minkfish <i>(Menticirrhus focaliger)</i>														
Black drum <i>(Pogonias cromis)</i>	250	32	32	35	31	250	65	35	35	80	4	35	35	54
	34	34	36	33			125	37	37	98		37	37	69
	65	36	37	102			152	38	38	105		38	40	116
	217	37	38	116			217	40	40	116		40	41	193
		38	39	118				41	41	244		41	42	212
		39	40	240				42	42	251		42	176	225
		40	41	244				56	56	257		81	192	227
		41	42					57	58	260		143	259	229
		42	113					58	97			144	261	
		46	114					97	151				176	
		113	115					151	178				191	
		115	119					152	179				192	
		249	259					178	183				214	
		250						179	188				226	
		259						180	196				259	
								183	217				261	
								188	245					
								196	246					
								197	247					
								217	259					
								245						
								246						
								247						
								259						
Atlantic croaker <i>(Micropogon undulatus)</i>														
	34	25	25	24		65	24	24	56		4	20	4	55
	65	31	32	33		66	25	25	68		59	54	35	143
		32	35	102		125	57	35	98		69	59	54	144
		34	46	113		217	65	57	105		91	69	69	193
		46	259	114		251	66	80	124		147	81	79	212
		65	119				80	97	151		191	88	81	
			244				97	129	168		213	91	91	
			249				127	145	179			147	147	
							129	178	188			176	176	
							145	257	196			191	191	
							155	259	197			213	192	
							217		244			225	226	
							251		245			226	227	
								246				227	229	
								257				229	231	
								260				230	259	
												231	261	
												233		
												287		
Red drum <i>(Sciaenops ocellata)</i>														
	36	31	31	102		65	35	35	98		4	35	4	54
	217	32	32	116		125	37	37	99			37	35	116
		34	33	118		152	38	38	116			38	37	193
		35	35			178	40	40	128			40	38	212
		36	36			217	41	41	155			41	40	214
		37	37				42	42	257			42	41	227
		38	38				56	56	260			81	42	229
		39	39				57	58				143	144	
		40	40				58					144	192	
		41	41				97	97				191	226	
		42	42				125	151				192	259	
		46	113				152	178				226	261	
		65	114				178	179				231		
		113	115				180	196				259		
		114	119				183	245				261		
		115	142				188	246						
		119	249				196	247						
		217	250				197	250						
		249	259				217	251						
		250	293				245	259						
		259					246							
							247							
							250							
							251							
							259							

Appendix Table A.--References to life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico: Texas. E = egg; L = larva; J = juvenile; A = adult; U = unspecified.

Family - Species	TEXAS														
	I Rio Grande River through Laguna Madre					II Corpus Christi Bay to Freeport			III Freeport through Sabine River						
	E	L	J	A	U	E	L	J	A	U	E	L	J	A	U
Ephippidae - spadefishes															
Atlantic spadefish (<i>Chaetodipterus faber</i>)	65			32		125	24	65	68		4	4	20		
						97	97	88	80		69	69	191		
						125	97	168			81	81	212		
											88	88	227		
											226	226	231		
Mugilidae - mullets															
Striped mullet (<i>Mugil cephalus</i>)	97	31	31	32		26	25	145	68		4	4	20		
	97	46	102			65	97	243	80		88	226	54		
	119	97	105			97	98		99		91	91	69		
		119	114			98	120		105		214	214	143		
			190			125	126		124		225	225	144		
			249			273	128		168		226	226	191		
							145		190				212		
							217		251				227		
							232						246		
							273								
White mullet (<i>Mugil curema</i>)	97	97	97	32		26	97		98		226	176		54	
				46		97	125		99		228	225		212	
				249		125	232		168			226			
									190			227			
												228			
Fantail mullet (<i>Mugil trichodon</i>)															
Sphyraenidae - barracudas															
Guaguanche (<i>Sphyraena guachancho</i>)					15			97		106					
								125							
Great barracuda (<i>Sphyraena barracuda</i>)								125							
Northern sennet (<i>Sphyraena borealis</i>)									125						
Scombridae - mackerels and tunas															
Little tunny (<i>Euthynnus alletteratus</i>)															
King mackerel (<i>Scomberomorus cavalla</i>)					32					257					
Spanish mackerel (<i>Scomberomorus maculatus</i>)	34		32			125	125	97	68		227		212		
	46		102			125		125	168			229			
		249							183						
									257						
Bothidae - lefteye flounders															
Gulf flounders (<i>Paralichthys alboguttata</i>)					32		125	251	97	14			69		
					119		125		125	151			212		
					249										

Appendix Table A.--References to life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico: Texas. E = egg; L = larva; J = juvenile; A = adult; U = unspecified.

Family - Species	TEXAS														
	I Rio Grande River through Laguna Madre					II Corpus Christi Bay to Freeport				III Freeport through Sabine River					
	E	L	J	A	U	E	L	J	A	E	L	J	A	U	
Southern flounder <i>(Paralichthys lethostigma)</i>															
25	31	102				125	24	35	14	59	4	4	14		
31	34	119					35	42	68	191	35	35	69		
32	35	249					37	56	80		37	42	193		
34	36						38	57	98		38	59	212		
35	39						40	58	124		40	192	214		
37	42						41	97	128		41	259	225		
38	46						42	151	168		42	261	227		
39	113						56	178	183		59		231		
40	115						57	179			81				
41	142						58	188			88				
42	259						97	196			143				
	46						145	245			144				
	113						151	246			191				
	115						178	247			192				
	259						179	251			259				
							180	259			261				
							188								
							196								
							197								
							245								
							246								
							247								
							251								
							259								
							259								
Balistidae - triggerfishes and filefishes															
Gray triggerfish <i>(Balistes capriscus)</i>															
Orange filefish <i>(Aluterus schoepfii)</i>											249	125			
Tetraodontidae - puffers															
Southern puffer <i>(Sphoeroides</i> <i>nephelus)</i>											119	24	15	226	20
							25	68			249	68		229	69
							125	124						143	
							217	127						191	
								251						212	
														214	
														225	
														227	

Appendix Table B.--References to life stages of selected recreational fishes in estuarine areas of the U.S. coast or the Gulf of Mexico: Louisiana, Mississippi, and Alabama. E = egg; L = larva; J = juvenile; A = adult; U = unspecified.

Family-Species	LOUISIANA					MISSISSIPPI					ALABAMA										
	IV West of Mississippi River					V East of Mississippi River					VI Mississippi Coast					VII Alabama Coast					
	E	L	J	A	U	E	L	J	A	U	E	L	J	A	U	E	L	J	A	U	
Orectolobidae - carpet sharks																					
Nurse shark (<i>Ginglymostoma cirratum</i>)																					
Carcharhinidae - requiem sharks																					
Finetooth shark (<i>Aprionodon isodon</i>)																60			266	295	
Blacknose shark (<i>Carcharhinus acronotus</i>)																60			266	295	
Bull shark (<i>Carcharhinus leucas</i>)	49 74	74	202				75		87							60			295		
Blacktip shark (<i>Carcharhinus limbatus</i>)																60		295		266	
Sandbar shark (<i>Carcharhinus milberti</i>)																					
Atlantic sharpnose shark (<i>Rhizoprionodon terraenovae</i>)																		295	295		
Sphyrnidae - hammerhead sharks																					
Scalloped hammerhead (<i>Sphyrna lewini</i> = <i>S. diplaneura</i>)																60			295		
Great hammerhead (<i>Sphyrna mokarran</i>)																			295		
Bonnethead (<i>Sphyrna tiburo</i>)																90	60		295	266	
Other hammerheads (<i>Sphyrna</i> spp.)																	60				
Elopidae - tarpons																					
Ladyfish (<i>Elops saurus</i>)	121 202	220 248				78 89 107 294		121	74 75 220 248						90 158	60		267 295	266 267 295	295	
Tarpon (<i>Megalops atlantica</i>)						202										90 210	60		266	295	
Bonefish (<i>Albulia vulpes</i>)																					
Clupeidae - herrings																					
Alabama shad (<i>Alosa alabamae</i>)						89														295	
Skipjack herring (<i>Alosa chrysochloris</i>)	82 220	219 220	218									87 121								295	
Ariidae - sea catfishes																					
Sea catfish (<i>Arius felis</i>)	82 219 220	82 219 220	82 121 218 282 283	78 89 121 218 282 283		220	74 75 220	74 75 220	87 121							90 90 60		194 266 267 295	194 266 267 295	223	

Appendix Table B.--References to life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico: Louisiana, Mississippi, and Alabama. E = egg; L = larva; J = juvenile; A = adult; U = unspecified.

Family-Species	LOUISIANA					MISSISSIPPI					ALABAMA									
	IV West of Mississippi River					V East of Mississippi River					VI Mississippi Coast					VII Alabama Coast				
	E	L	J	A	U	E	L	J	A	U	E	L	J	A	U	E	L	J	A	U
Gafftopsail catfish <i>(Bagre marinus)</i>	96 220	219 96 219 220	82 202 220	96 89 107	78 121 121 218 282 283 294	220	220	74 220	87 121 241		158		60		267 266 295	194 266 295	266 267 295	268		
Centropomidae - snooks																				
Tarpon snook <i>(Centropomus pectinatus)</i>																				
Snook <i>(Centropomus undecimalis)</i>																				
Percichthyidae - temperate basses																				
Striped bass <i>(Morone saxatilis)</i>															60 172		266 295			
Serranidae - sea basses																				
Southern sea bass <i>(Centropristes melanota)</i>																				
Rock sea bass <i>(Centropristes philadelphica)</i>	82 185	185 220	283			185	185 220				90	158	60			266 295	266 295			
Jewfish <i>(Epinephelus itajara)</i>																				
Gag <i>(Mycteroperca microlepis)</i>																	295	295		
Red grouper <i>(Epinephelus morio)</i>																				
Pomatomidae - bluefishes																				
Bluefish <i>(Pomatomus saltatrix)</i>	82 220	220						89							60		295	266		
Rachycentridae - cobias																				
Cobia <i>(Rachycentron canadum)</i>		82													60		266	295		
Carangidae - jacks and pompanos																				
Blue runner <i>(Caranx cryos)</i>	220		89												90	60		266		
Crevalle jack <i>(Caranx hippos)</i>	96 219 220	78 89 121		74 75 220		87 121					90		60			266 267 295	266 267 295			
Greater amberjack <i>(Seriola dumerili)</i>		202 218 283 294																		

Appendix Table B.--References to life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico:
Louisiana, Mississippi, and Alabama. E = egg; L = larva; J = juvenile; U = unspecified.

Family-Species	LOUISIANA					MISSISSIPPI					ALABAMA									
	IV West of Mississippi River					V East of Mississippi River					VI Mississippi Coast					VII Alabama Coast				
	E	L	J	A	U	E	L	J	A	U	E	L	J	A	U	E	L	J	A	U
Florida pompano <i>(Trachinotus carolinus)</i>		21	78				220		87						60		266			
		82	89														295			
		220	202																	
Permit <i>(Trachinotus falcatus)</i>			89												60		266			
																	295			
Lutjanidae - snappers																				
Red snapper <i>(Lutjanus campechanus)</i>															60		266	295		
Gray snapper <i>(Lutjanus griseus)</i>		220	283				220							158		60		266	267	295
Lane snapper <i>(Lutjanus synagris)</i>		82													60		266			
		220															295			
Lobotidae - tripletails																				
Tripletail <i>(Lobotes surinamensis)</i>		220	11												11		295	295	11	
			12												60					
			89																	
			202																	
Gerreidae - mojarras																				
Striped mojarra <i>(Diapterus plumieri)</i>																				266
Pomadasytidae - grunts																				
Tomtate (<i>Haemulon aurolineatum</i>)																				
White grunt <i>(Haemulon plumieri)</i>																				
Pigfish <i>(Orthopristis chrysoptera)</i>		82	82												90		60		295	266
		220																		
Sparidae - porgies																				
Sheepshead <i>(Archosargus probatocephalus)</i>		82	82	78				87	75	116					90		60		266	267
		219	219	89				87	121						158				267	295
			116					241											268	
			121																	
			202																	
			218																	
			294																	
Pinfish <i>(Lagodon rhomboides)</i>		202	82	82	51			74	74	51					90		51		267	
		219	219	78				75	75	87					158		60		295	
		220	220	82				220	220	121							209		223	
			121					241											266	
			218																	
			294																	

Appendix Table B.--References to life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico:
Louisiana, Mississippi, and Alabama. E = egg; L = larva; J = juvenile; A = adult; U = unspecified.

Family-Species	LOUISIANA					MISSISSIPPI					ALABAMA										
	IV West of Mississippi River					V East of Mississippi River					VI Mississippi Coast					VII Alabama Coast					
	E	L	J	A	U	E	L	J	A	U	E	L	J	A	U	E	L	J	A	U	
Sciaenidae - drums																					
Silver perch <i>(Bairdiella chrysura)</i>	202	82	82	78		74	74	87			90	159	60			266	267	267			
		96	96	89		75	75	121			159	159	209				295	295			
		202	220	121		220	220	167													
		219	218					241													
		220	283																		
		294																			
Sand seatrout <i>(Cynoscion arenarius)</i>	202	82	82	78		74	74	87			61	61	60			266	267				
		96	218	89		75	75	116			158	158				267	267	295			
		218	219	107		220	220	121													
		219	220	116				167													
		220	121																		
		282																			
		283																			
		294																			
Spotted seatrout <i>(Cynoscion nebulosus)</i>		74	74	78		87	87	116			90	158	60			266	295	116			
		75	75	89		220	220	121			158	158	116			267	267	268			
		82	82	116			264	167					210			295		274			
		88	96	121									274								
		96	187	218																	
		219	202	274																	
		220	220	282																	
		239	283																		
Spot <i>(Leiostomus xanthurus)</i>	121	82	96	78		73	73	74	87		90	90	60			267	136	201	223		
	202	88	121	89		213	74	75	167		158	158	205				201	266	268		
		96	218	107			75	121	241				209			266	267	289			
		121	219	282			121	213								267	295				
		202	220	283			213	220													
		218	294				220	263													
		219					263														
		220																			
Southern kingfish <i>(Menticirrhus americanus)</i>	202	82	82	78		220	220	87			90	158	60			266	266				
		219	220	89			116				158	116				295					
		220	96				167					206									
		116					241														
		218																			
		283																			
Minkfish <i>(Menticirrhus focaliger)</i>		82		218			87	87					60			266					
													295								
Black drum <i>(Pogonias cromis)</i>		75	202	89		74	74	116					60			267	295	266			
		219	220	107		220	220	121								201	266	223			
		220	116				167									267	267	289			
		282														295	295				
		283																			
		294																			
Atlantic croaker <i>(Micropogon undulatus)</i>		96	5	82	89	73	73	75	167		61	61	60			201	201	201	136		
		121	78	121	107	74	74	87	241		108	90	209				266	266	223		
		156	82	218	283	75	75	121			208	208				267	267	289			
		202	88	219	294	121	87	213				211				295	295				
		282	96	220		213	121	220													
		121				265	213	265													
		156					220														
		202					265														
		218																			
		219																			
		220																			
		282																			

Appendix Table B.--References to life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico:
Louisiana, Mississippi, and Alabama. E = egg; L = larva; J = juvenile; A = adult; U = unspecified.

Family-Species	LOUISIANA					MISSISSIPPI					ALABAMA					Alabama Coast				
	West of Mississippi River					East of Mississippi River					Mississippi Coast					Alabama Coast				
	E	L	J	A	U	E	L	J	A	U	E	L	J	A	U	E	L	J	A	U
Red drum <i>(Sciaenops ocellatus)</i>																				
	74	74	116			22	22	116			90	238	60						266	268
	75	75	283			87	23	167			158		116							
	220	202	294			220	87				238									
						238	238													
Ephippidae - spadefishes																				
Atlantic spadefish <i>(Chaetodipterus faber)</i>																				
	82	82	82	78		220	220	87								60		266	267	
	219	220	89					121								209		267	295	
	220	121						241										295		
		202																		
		218																		
		282																		
Mugilidae - mullets																				
Striped mullet <i>(Mugil cephalus)</i>																				
	121	75	75	78		121	74	74	87		90	90	90	60		267	266	266	116	
	220	88	121	89		220	121	121	116		158	108	116			267	267	223		
		121	202	107			220	220	167		210	210	207			295	295	289		
		219	219	218				241												
		220	220	294																
White mullet <i>(Mugil curema)</i>						121					90	90	60			267	266	295		
						282					210		209			267		267		
Fantail mullet <i>(Mugil trichodon)</i>																				
Sphyraenidae - barracudas																				
Guaguanche <i>(Sphyraena guachancho)</i>						220										60		266		
Great barracuda <i>(Sphyraena barracuda)</i>						82										60		90	295	
Northern sennet <i>(Sphyraena borealis)</i>						220										60		266	295	
Scombridae - mackerels and tunas																				
Little tunny <i>(Euthynnus alletteratus)</i>																			295	
King mackerel <i>(Scomberomorus cavalla)</i>						220										60		266	295	
Spanish mackerel <i>(Scomberomorus maculatus)</i>						82	82	89			220	87				60		266	295	
						219		202												
						220		218												
Bothidae - lefteye flounders																				
Gulf flounder <i>(Paralichthys albiguttata)</i>						220	220	89								60				
								282												
Southern flounder <i>(Paralichthys lethostigma)</i>						202	82	82	78		74	74	87			76	76	60		
											220	220	241							
											219	121	121							
											220									
											218									
											282									
											294									

Appendix Table B.--References to life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico:
Louisiana, Mississippi, and Alabama. E = egg; L = larva; J = juvenile; A = adult; U = unspecified.

Family-Species	LOUISIANA					MISSISSIPPI					ALABAMA									
	IV West of Mississippi River					V East of Mississippi River					VI Mississippi Coast					VII Alabama Coast				
	E	L	J	A	U	E	L	J	A	U	E	L	J	A	U	E	L	J	A	U
Balistidae - triggerfishes and filefishes																				
Gray triggerfish (<i>Balistes capriscus</i>)																60			295	
Orange filefish (<i>Aluterus schoepfii</i>)																60		266	295	
Tetraodontidae - puffers																				
Southern puffer (<i>Sphoeroides nephelus</i>)	219		89			220		202			220		87			60		266	295	
	220		202					218												
			282																	

Appendix Table C.--References to life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico: Florida.
E = egg; L = larva; J = juvenile; A = adult; U = unspecified.

E = egg; L = larva; J = juvenile; A = adult; U = unspecified.

Family-Species	FLORIDA												XII													
	VIII Perdido Bay to Lighthouse Point					IX Lighthouse Point to Anclote Key					X Anclote Key to Cape Romano					XI Cape Romano to Florida Bay										
	E	L	J	A	U	E	L	J	A	U	E	L	J	A	U	E	L	J	A	U	E	L	J	A	U	
Clupeidae - herrings																										
Alabama shad (<i>Alosa alabamae</i>)		157	157	165		186	186																			
Skipjack herring (<i>Alosa chrysochloris</i>)																										
Ariidae - sea catfishes																										
Sea catfish (<i>Arius felis</i>)	281	281	2	112	70	288	146	146	137		195	195	195	95	292	292	8	8	7	236	163	163	63			
Gafftopsail catfish (<i>Bagre marinus</i>)	281	281	146	112	137	288	281	146	181		195	195	195	94	258	104	88	7	203	236	203	117				
Centropomidae - snooks																										
Tarpon snook (<i>Centropomus pectinatus</i>)																									204	
Snook (<i>Centropomus undecimalis</i>)	288	67	181			299					153						8	8	7		117	163	131			
																	84	84	19		163	177	204			
																	88	104	30		177	236	237			
																	104	235	45		236	278	242			
																	177	285	85		278	275				
																	234	292	173		290		279			
																	258	198								
																	290	262								
																	292	279								
Percichthyidae - temperate basses																										
Striped bass (<i>Morone saxatilis</i>)			10								10															
Serranidae - sea basses																										
Southern sea bass (<i>Centropristes melanota</i>)	112	112	181			299	199	199	200		173	173	181		258	285	7							161	163	
Rock sea bass (<i>Centropristes philadelphica</i>)											195	195	182		292	292	173									
Jewfish (<i>Epinephelus itajara</i>)	112										50						99	99	162		203	278	117			
																	292	258	262		236	278	131			
																								134		
																								204		
																								237		
																								253		
																								275		
Gag (<i>Mycteroperca microlepis</i>)	2	2	182			112					195	224						169		7		163		131		
																	273		173					150	278	
Red grouper (<i>Epinephelus morio</i>)	2	112	181			299	182				181	182						273		262				216		
																	292									

Appendix Table C.--References to life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico: Florida.
E = egg; L = larva; J = juvenile; A = adult; U = unspecified.

Appendix Table C.--References to life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico: Florida
 E = egg; L = larva; J = juvenile; A = adult; U = unspecified.

Family-Species	FLORIDA																			
	VIII Perdido Bay to Lighthouse Point					IX Lighthouse Point to Anclote Key				X Anclote Key to Cape Romano			XI Cape Romano to Florida Bay							
	E	L	J	A	U	E	L	J	A	U	E	L	J	A	U	E	L	J	A	U
Lane snapper <i>(Lutjanus synagris)</i>			2					224			104	292	7			163	278	63		
											234		88			236		64		
											258		93			275		131		
											292		132			278		173		
													173			237				
													262							276
Lobotidae- tripletails																				
Tripletail <i>(Lobotes surinamensis)</i>		112		11				195		11			292	11			236			
				97									258			278				
				299																
Gerreidae- mojarras																				
Striped mojarra <i>(Diapterus plumieri)</i>											30	8	7			203	163	173		
											104	30	45			204	203	237		
											244	84	162			236	204	278		
											258	104				236	291			
											273	244								
											292	258								
												273								
												292								
Pomadasytidae- grunts																				
Tomtate <i>(Haemulon aurolineatum)</i>		112	112					224					292				163	163		
																278				
White grunt <i>(Haemulon plumieri)</i>		2	2	165				53		94			258	7			163	163	237	
			112	181				195		95			292			236	278		275	
			182					224		181										
			216							182										
Pigfish <i>(Orthopristis chrysoptera)</i>		281	112	112	137			53	173	51			8	8	7		63	163	64	
			146	165				94	181				84	84	47		163	278	131	
			184	181				95	182				88	173	85		236		173	
			215	182				149	302				104	292	93		278		237	
			281	199				173					173		162				275	
				200				195					222		164					
								224					258		262					
													292							
Sparidae-porgies																				
Sheepshead <i>(Archosargus probatocephalus)</i>		112	112	2				149	19	17			30	8	7		117	117	63	
		288	146	137				195	149	94			104	17	47		203	236	64	
		288	165					195	181				258	84	85		236	278	131	
		181						224	182				273	88	93		278		173	
		182											292	273	116				204	
															162				237	
															164				242	
															173				277	
															198					
															253					
															255					
															262					
															279					
															285					

Appendix Table C.--References to life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico: Florida.
E = egg; L = larva; J = juvenile; A = adult; U = unspecified.

Appendix Table C.--References to life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico: Florida
 E = egg; L = larva; J = juvenile; A = adult; U = unspecified.

Family-Species	FLORIDA																					
	VIII Perdido Bay to Lighthouse Point					IX Lighthouse Point to Anclote Key			X Anclote Key to Cape Romano			XI Cape Romano to Florida Bay										
	E	L	J	A	U	E	L	J	A	U	E	L	J	A	U	E	L	J	A	U		
Minkfish <i>(Menticirrhus focaliger)</i>	112	112		181				181			222		7									
	146		182					182			258		28									
	281		200									104										
Black drum <i>(Pogonias cromis)</i>	146	112	70			149		181			8	273	7			141	236	163	237			
			137					182			84	292	85			278	278	242				
			181								104		162						275			
			182								258		164							277		
			250								273		198									
											292											
Atlantic croaker <i>(Micropogon undulatus)</i>	281	110	2	137		195	195	153			104	88	88	7					236	237		
	111	111	165			215	215	181			104			164						275		
	146	112	181					182				222								278		
	184	146	182					302				258										
	281	281	199								292											
	288	288	200																			
			223																			
Red drum <i>(Sciaenops ocellatus)</i>	146	112	70			149		94			30	8	17	7		141	117	117	48			
	281	288	116			195		95			17	88	28			203	140	140	63			
	288		137					116			19	273	47			275	203	275	131			
			165					153			30		85				204	278	173			
			181					181			84		116				236	300	242			
			182					182			88		162									
			200					215			104		164									
								301			222		173									
											258		198									
											273		262									
											292		279									
Ephippidae-spadefishes																						
Atlantic spadefish <i>(Chaeodipterus faber)</i>	2	2	165			149	195	94			258	8	17	7		163	163	163	63			
	112	112	181			195		95			104	258	84			236	236	131				
	146	288	182			215		173			258	292	86			278	278	173				
	281		184			224		181			292		88						237			
	288		200					182					93						275			
			216									162										
											164											
											173											
											234											
											262											
Mugilidae-mullets																						
Striped mullet <i>(Mugil cephalus)</i>	72	2	2	70		95	43	43	94		84	8	8	7		133	88	63				
	112	9	43	116		149	44	44	116		104	28	27	30		163	163	117				
	146	43	44	119		224	95	133	135		222	84	29	45		173	173	131				
	281	44	72	135			133	173	181		258	104	84	47		236	236	150				
	72	112	137			149	195	182			273	133	85	116					263			
	112	133	181			173	286				173	133	122						278			
	133	281	182			195					258	173	135						237			
	215	288	200								273	273	164						275			
	281		216								292	286	262									
	288										292	272										
											279											
White mullet <i>(Mugil curema)</i>	146	2	2	70		149	149		181		88	8	258	7		88	88	131				
	281	146	112	181		195		182			104	28	30			163	163	150				
	281		182									84	116						236			
			216									88	262						237			
			288									104	272						275			
												258										
											273											
											292											

Appendix Table C.--References to life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico.

Florida.

E = egg; L = larva; J = juvenile; A = adult; U = unspecified.

Appendix Table C.--References to life stages of selected recreational fishes in estuarine areas of the U.S. coast of the Gulf of Mexico: Florida
 E = egg; L = larva; J = juvenile; A = adult; U = unspecified.

Family-Species	FLORIDA															
	VIII Perdido Bay to Lighthouse Point				IX Lighthouse Point to Anclote Key				X Anclote Key to Cape Romano				XI Cape Romano to Florida Bay			
	E	L	J	A	E	L	J	A	E	L	J	A	E	L	J	A
Balistidae-- triggerfishes and filefishes																
Gray triggerfish (<i>Balistes</i> <i>capriscus</i>)		112	112	181				181			258		236		237	
				182				182								
				199												
Orange filefish (<i>Aluterus</i> <i>schoepfii</i>)		112	112	165			195	195	94		258	258	93		275	
				281					95		292	292	173			
Tetraodontidae-- puffers													236	163	275	
Southern puffer (<i>Sphoeroides</i> <i>nephelus</i>)	2	2	165		53	195	94		8	8	7				63	
	112	112	182		95	173			84	84	94		163	236	131	
	146				149	182			88	292	132		236	278	173	
	281				195				104		162		278		237	
	288				224				222		164				275	
									258		173					
									292							